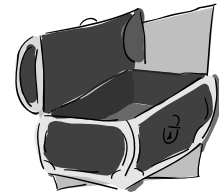


# Glossary



## **Abscission**

Separation of leaves or other structures from an axis by the formation of an layer that reduces and then cuts off the flow of water and nutrients between leaf and tree

## **Acclimation**

Process by which plants become increasingly resistant to subfreezing temperature without sustaining injury.

## **Adhesion**

Molecular attraction that holds the surfaces of two substances together e.g. attraction of water molecules to other kinds of molecules

## **Aerosols**

Particles of solid and liquid suspended in the atmosphere

## **Almost Closed System**

A system in which almost no matter enters or leaves; the Earth system is considered an almost closed system because only a small amount of gases and particles enter or leave the system at the top of the atmosphere. In studying the Earth as a whole you use

## **Annotate**

To label

## **Anthocyanin**

Pigment in leaves that is bright red and purple

## **Aquifer**

A body of permeable rock or gravel capable of storing water underground

## **Atmospheric Carbon**

Carbon that is in gaseous form (combined with other atoms like oxygen) that make up part of the Earth's atmosphere such as carbon dioxide and carbon monoxide

## **Average Surface Temperature**

The surface temperature of the Earth averaged over a wide region and over a long period of time

## **AVHRR Satellite**

Satellite that carries the Advanced Very High Resolution Radiometer instrument

## **Axis**

The invisible straight line between the North and South poles

## **Biogeochemical Cycles**

Movement of chemical elements from organisms to physical environment back to organisms in a circular cycle

## **Biomass**

Total mass of all the organisms of a given type or in an area or region

## **Biome**

A major ecological community type (e.g., rain forest, grassland, desert)

## **Biota**

All of the organisms living in a particular region, including plants, animals, and microorganisms

## **Boreal**

Of or relating to northern regions or the Northern Hemisphere

## **Boundary**

A line or a plane that divides two different areas or regions

## **Broad-leafed Trees**

Trees that have wide and flat leaves rather than needlelike leaves

## **Budburst**

The opening or breaking of buds which are hard protective covers containing miniature leaves. It is a seasonal event that signals the start of leaf growth or green-up

## **Canopy**

The uppermost layer of plant leaves that are detected by satellite remote sensing

## **Capillary Action**

Attraction of the surface of a liquid to the surface of a solid which is expressed as the readiness of a liquid such as water, to flow through a solid such as paper

## **Carbon Cycle**

The movement of carbon through the surface, interior, and atmosphere of the Earth, which may involve organisms

**Carbon Fixation**

The process by which carbon taken from the carbon dioxide in the air is incorporated in the cells of a plant or microorganism, such as in photosynthesis

**Carotene**

Pigment in leaves that is orange

**Celestial Sphere**

An imaginary sphere of infinite extent with the Earth at its center on which the stars, planets, and other heavenly bodies appear to be located

**Chemical Cycle**

The movement of various chemicals through the surface, interior, and atmosphere of the Earth and the chemical reactions that impact the form of those chemicals

**Chemical Energy**

The energy produced or absorbed in the process of a chemical reaction

**Chlorophyll**

A pigment which gives plants their green color and traps light energy for plants, algae, and some bacteria to use in making food

**Chromatography**

The separation of substances in a mixture by placing the mixture in a mobile phase (water or other solvent) that is placed over a stationary phase (e.g. paper)

**Climate**

The statistical collective of the weather conditions of a specified area during a specified time period

**Climate Cycles**

Alternating episodic climate events that recur with some regularity, but are not strictly periodic

**Climatic Island**

An area of uniform climate, such as a mountain top, that is isolated from other areas similar to it

**Climatogram**

A graph showing the long term average of temperature and precipitation totals for a region (a year or longer)

**Climatograph**

See climatogram

**Closed System**

A system in which no matter enters or leaves

**Cohesion**

Force holding a solid or liquid together due to the attraction of like molecules, for example the attraction of water molecules to each other

**Components**

Parts of a whole

**Conifers/Coniferous**

Any cone-bearing trees, chiefly evergreen trees of the class Coniferinae, including pine, fir, and spruce that have needle-like leaves

**Connections**

Links between one component of the Earth system and another

**Consumers**

Living things that use resources in their environment to survive

**Continental Climate**

Climate characteristic of the interior of a large land mass, generally marked by large annual and daily ranges of temperature, low relative humidity and generally moderate or small amounts of rainfall.

**Contrast**

The ratio between maximum and minimum values

**Control**

An experimental set up and result against which other experiments that incorporate modifications or changes and the results of those experiments are compared

**Crown**

The leafy portion of a tree or shrub. Even the lowest branches of a tree or shrub are part of the crown

**Cryosphere**

Part of the Earth that is frozen, comprising ice sheets, glaciers, and sea areas covered by ice

**Dew Point**

The temperature to which air must be cooled to reach saturation of water vapor to occur

**Diagram**

A visual representation of a system used to communicate information about that system to others

**Diurnal**

Daily, as in diurnal rotation of the Earth

**Dormancy**

State of suspended growth and metabolism

**Earth System**

The components that comprise the environment of the Earth, including the atmosphere, hydrosphere, lithosphere, pedosphere (soils), cryosphere (ice), and biosphere, and the processes that cause them to interact

**Earth System Science**

An area of scientific investigation that focuses on the processes which take place in the atmosphere, hydrosphere, lithosphere, pedosphere (soils), cryosphere (ice), and biosphere and the processes that allow them to interact.

**Ecliptic**

Where the Earth's orbit intersects the celestial sphere

**Ecologist**

A scientist who studies the relations between organisms and their environment

**Ecology**

The study of the relations between organisms and their environment

**Ecosystem**

A local biological community and its pattern of interaction with its environment

**Elevation**

The vertical distance above mean sea level

**Energy Cycle**

The movement of energy through the surface, interior, and atmosphere of the Earth in all of its forms

**Environment**

The surrounding conditions that affect the quality of life of plants and animals

**Environmental variables**

Physical properties that describe the state of the environment

**Equator**

An invisible circle that divides the Earth into two hemispheres

**Equatorial**

Located at the equator or in the plane of the equator

**Equinox**

(*equal night*) when the sun crosses the equator, causing the length of day and night to be equal in both hemispheres

**Estuary**

Semi-inclosed coastal body of water which has a free connection with the open sea

**Flux**

The amount of material flowing through a specified surface or system per unit time

**Fluxes**

The rate of flow of some quantity (such as water, energy or carbon for example) from one place or reservoir to another

**Frazzle Ice**

Known also as frazil ice, flowing water ice that forms platelets rather than continuous sheets on rivers and other moving bodies of water

**GIS**

Geographic Information System

**Grassland**

An area of natural vegetation dominated by grasses ( areas are called steppes or prairies in temperate regions and savannahs in tropical regions)

**Green-down**

When plants start changing colors and/or lose their leaves at the end of the growing season

**Green-up**

When plants sprout new growth

**Grey-scale**

A range of tones from white to black that indicate on a map or other visualization the relative amounts of the quantity being described

**Growing Season**

That part of the yearly plant growth cycle when vegetation comes out of winter dormancy, grows, and reproduces.

**Hemisphere**

Half of a spherical or roughly spherical body (such as the Earth)

**Icosahedron**

20-sided polyhedron

**Insolation**

The energy that comes to the Earth from the Sun (INcoming SOLar radiATION)

**Interconnections**

The processes by which the different components of the Earth system interact with each other

**Kinetic Energy**

The energy an object has because of its motion

**Land Cover**

Usually vegetation but in the absence of vegetation an indication of what is on the land surface

**Landmark Value**

The point on a color scale where the representative value undergoes a distinctive change

**Latent Heat**

The energy stored or used by a substance to produce a change in phase, either between solid and liquid, liquid and gas, or solid and gas

**Latitude**

The angular distance of a part of the Earth that is north or south of the Earth's equator; a region of the Earth considered in relation to its distance from the equator

**Lichen**

A combination of an alga (or a cyanobacterium) and a fungus, living in symbiotic relationship characteristically forming a crustlike, scaly or branching growth on rocks or tree trunks

**Limiting Factor**

An ecosystem variable whose presence or absence limits the growth of the ecosystem elements

**Lithosphere**

The solid portion of the Earth

**Liverwort**

Moss-like plants that grow and help decay rocks or tree trunks on damp ground

**Longitude**

Distance measurement that goes from one pole to another pole around the outside of the Earth

**Map Projection**

The systematic arrangement of latitudes and longitudes (and associated surface features) that shows a curved surface on a flat plane

**Marine Climate**

Climate of a region that is affected by the sea. Generally characterized by mild winters, cool summers, and an even distribution of rainfall through the year

**Maxima**

(Plural of maximum) the greatest possible amount or degree

**Maximum Greenness**

When vegetation vigor peaks

**Mercator Projection**

A map projection of the Earth in which the latitude lines are drawn as straight lines the same length as the equator and cross the longitude lines at right angles. The biggest disadvantage is the distortion of the land near the poles

**Meridian**

An imaginary circle on the Earth's surface that passes through the North and South poles

**Mid-latitude**

The latitude range generally between 30 degrees to 60 degrees

**NDVI**

Normalized Difference Vegetation Index

**Nitrogen Cycle**

A series of chemical processes, mostly occurring in organisms, in which nitrogen atoms are circulated in the Earth systems

**NOAA**

National Oceanographic and Atmospheric Administration

**Northern Hemisphere**

The half of the Earth that lies north of the equator

**Ocean Currents**

The movement of ocean water in a regular way along a defined path that can either be cyclic or continuous

**Open System**

A system in which mass and energy enter and leave

**Ozone**

One of the allotropes of oxygen (O<sub>3</sub>), sometimes referred to as tri-oxygen

**Perpendicular**

A line at right angles to a line or plane (for example, when you watch a sunset, you are standing perpendicular to the horizon)

**Petiole**

Slender stem that supports the leaf or leaf stalk

**pH**

A measure of acidity on a scale of 0 to 14, 0 being all hydrogen ion (highly acidic), 14 being no hydrogen, all hydroxyl ions (highly basic)

**Phenology**

The study of natural response of living organisms to seasonal and climatic changes in their environment. Examples of phenological events include migration of birds and butterflies, flowering, salmon spawning, etc. Plant phenology includes green-up and green-down

**Photosynthesis**

The process used by green plants, algae and photosynthetic bacteria to use the energy of sunlight to convert carbon dioxide and water into carbohydrates, through the green pigment chlorophyll; this process releases oxygen and is the chief source of atmosphere

**Polar**

Regions on the Earth poleward of 60 degrees latitude

**Polyhedron**

A solid formed or bounded by planes or faces

**Potential Energy**

The energy an object has or the objects' stored capacity to do work because of its configuration and position

**Potential Growing Season**

That part of the yearly temperature cycle when the temperature is above freezing, thus enabling plant growth to occur.

**Processes**

The progression of physical interactions between different components of the Earth system and between sub-components of the Earth system

**Producers**

Living things that as a result of their biologic processes release material into their environment that may be used by other living things

**Protractor**

A measuring device used to measure angles

**Region**

An area defined by a common feature or features

**Relationships**

Processes by which different components of the Earth system, or parts of the components of the Earth system interact and affect each other

**Remote Sensing**

A method of obtaining information about something without coming into physical contact with it

**Reservoirs**

A space to store a substance, or a supply of a substance

**Resolution**

The smallest area that can be identified individually in a map or satellite picture, or the smallest measurable change in a quantity

**Respiration**

A process by organisms that converts the energy in organic materials into energy for use by cells

**Rural**

An area with very little man made structures

**Satellite**

Any natural or man made object that orbits an body in space, man made satellites usually carry instruments for measuring various things about the Earth

**Scale**

The regular markings on an instrument that permit the readings of a measured quantity, or the relative size of an object or area used to help define the processes that affect that object or area

**Seasonal Cycle**

The regular progression through the year through winter, spring, summer, and fall

**Senescence**

The changes that occur in an organism between maturity and death; in a plant this is equivalent to “green-down” and is associated with a reduction and/or halt of plant photosynthesis

**Sensible Heat**

The energy involved in heating (or cooling in the case of a loss of sensible heat) of a surface or object

**Solar Energy**

Energy coming from the sun

**Solstice**

(*Stand still*) when the sun is at its greatest distance from the equator, resulting in the longest day in one hemisphere and the shortest day in the other hemisphere; the sun appears to “stand still” when it reaches its highest point on this day

**Southern Hemisphere**

The half of the Earth that lies south of the equator

**Spatial Relationship**

Where bodies are located in regards to each other (e.g., the Sun and the Earth)

**Sub Polar**

A climate zone lying between the temperate and polar zones

**Sub Tropical**

A climate zone lying between the tropic and temperature zones

**Suburban**

An land area in which there is a mixture of man-made structures and open spaces

**Surface Temperature**

The temperature of the surface or the air next to the surface of the Earth

**System**

A group of components that interact to produce a whole (in the case of the Earth system) or a specific results (in the case of a machine)

**Tannin**

Bitter waste product in leaves that is brown; common name for tannic acid or similar compounds

**Temperature**

A measure of the energy in an object or gas, measured with a thermometer

**Thermal inertia**

A material body's resistance to a change in temperature

**Time Scales**

The time period over which different processes occur ranging from seconds and minutes for the formation of clouds to billions of years for the formation of the Earth

**Transpiration**

Loss of water by plants mainly through the stomata to the atmosphere

**Tropic of Cancer**

The parallel of latitude 23° 27' north of the equator; the most northerly latitude at which the sun can shine directly overhead

**Tropic of Capricorn**

The parallel of latitude 23° 27' south of the equator; the most southerly latitude at which the sun can shine directly overhead

**Tropical**

Of, occurring in, or characteristic of the tropics

**Tundra**

Treeless plains that lie poleward of the tree line in the Arctic. Tundra lies mostly over permafrost and is not permanently covered with snow

**Urban**

Area mostly covered with man made structures

**Variables**

A characteristic that can be measured and can assume different values

**Vegetation Vigor**

Amount of plant growth

**Visualization**

Display of information graphically or on a map using color or grey-scales, and/or lines and symbols

**Water Cycle**

The cycle by which water is moved between the different components of the Earth system (atmosphere, hydrosphere, lithosphere, pedosphere, cryosphere, and biosphere) in its various states (solid, liquid, and gas)

**Watershed**

The total area from which water is drained by a river and its tributaries

**Weather**

The day to day state of the atmosphere, mainly with respect to its affect on life and human activities

**Winds**

The movement of air relative to the surface of the Earth

**Xanthophyll**

Pigment in leaves that is yellow